

**AMENDMENTS TO THE CLAIMS**

1. (currently amended): ~~An article of manufacture comprising a computer-readable medium having embodied thereon a set of program instructions configured to enable a computing device to perform a~~ A computer-implemented method for reconstructing metabolism of a mammalian organism in a non-disease state and a disease state, said method comprising:

- (a) collecting data regarding the mammalian organism's metabolism for said non-disease and disease states;
- (b) linking the data into metabolic pathways using a relational database;
- (c) ranking the metabolic pathways based on their relevance to human metabolism;
- (d) linking said ranked metabolic pathways to functional information, disease manifestations and/or high-throughput screening information;
- ~~(d)~~(e) identifying interconnections between the ranked metabolic pathways; and
- ~~(e)~~(f) creating and displaying interactive maps of the mammalian organism's metabolism in said non-disease and disease states ~~exclusively~~ on the basis of information obtained in steps (a) through ~~(d)~~(e).

2. (canceled)

3. (currently amended): ~~An article of manufacture comprising a computer-readable medium having embodied thereon a set of program instructions configured to enable a computing device to perform a~~ A computer-implemented method for identifying a mammalian drug target, said method comprising:

- (a) collecting data regarding a mammalian organism's metabolism for a non-disease state and a disease state;
- (b) linking the data into metabolic pathways using a relational database;
- (c) ranking the metabolic pathways based on their relevance to human metabolism;
- (d) linking said ranked metabolic pathways to functional information, disease manifestations and/or high-throughput screening information;
- ~~(d)~~(e) identifying interconnections between the ranked metabolic pathways;

~~(e)~~(f) creating and displaying interactive maps of the mammalian organism's metabolism in said non-disease and disease states ~~exclusively~~ on the basis of information obtained in steps (a) through ~~(d)~~(e); and

~~(f)~~(g) identifying a mammalian drug target by comparing differences between said non-disease and disease states using the metabolic maps.

4. (canceled)

5. (currently amended): The ~~article~~ method of claim 1, wherein said mammalian organism is a human.

6. (currently amended): The ~~article~~ method of claim 1, wherein said data regarding the mammalian organism's metabolism comprises expressed sequence tag data.

7. (currently amended): The ~~article~~ method of claim 1, wherein said data regarding the mammalian organism's metabolism comprises biochemical units comprising metabolic steps, chemical compounds, reactions and/or enzymatic functions.

8. (currently amended): The ~~article~~ method of claim 7, wherein said enzymatic functions comprise genes and proteins.

9. (currently amended): The ~~article~~ method of claim 7, wherein each of said biochemical units is linked to an annotation table, said annotation table comprising at least one field.

10 (currently amended): The ~~article~~ method of claim 9, wherein said at least one field is selected from the group consisting of organ localization, tissue localization, intracellular localization, intracellular compartmentalization, subcellular localization in another organism, a relationship to a disease, and a reference to an information source.

11-12. (canceled)

13. (currently amended): The ~~article~~ method of claim 3, wherein said mammalian organism is a human.

14. (currently amended): The ~~article~~ method of claim 3, wherein said data regarding the mammalian organism's metabolism comprises expressed sequence tag data.

15. (currently amended): The ~~article~~ method of claim 3, wherein said data regarding the mammalian organism's metabolism comprises biochemical units comprising metabolic steps, chemical compounds, reactions and/or enzymatic functions.

16. (currently amended): The ~~article~~ method of claim 15, wherein said enzymatic functions comprise genes and proteins.

17. (currently amended): The ~~article~~ method of claim 15, wherein each of said biochemical units is linked to an annotation table, said annotation table comprising at least one field.

18. (currently amended): The ~~article~~ method of claim 17, wherein said at least one field is selected from the group consisting of organ localization, tissue localization, intracellular localization, intracellular compartmentalization, subcellular localization in another organism, a relationship to a disease, and a reference to an information source.

19. (currently amended): ~~An article of manufacture comprising a computer-readable medium having embodied thereon a set of program instructions configured to enable a computing device to perform a~~ A computer-implemented method for predicting the existence of a novel enzyme in a mammalian organism, said method comprising:

- (a) collecting data regarding the mammalian organism's metabolism in non-disease and disease states;
- (b) linking the data into metabolic pathways using a relational database;
- (c) ranking the metabolic pathways based on their relevance to human metabolism;
- (d) linking said ranked metabolic pathways to functional information, disease manifestations and/or high-throughput screening information;

(d)(e) identifying interconnections between the ranked metabolic pathways;  
(e)(f) creating and displaying interactive maps of the mammalian organism's metabolism in said non-disease and disease states ~~exclusively~~ on the basis of information obtained in steps (a) through (d)(e); and  
(f)(g) predicting the existence of a novel enzyme by detecting a gap between two non-essential metabolites that cannot be filled by any known enzyme in said mammalian organism.

20. (currently amended): The ~~article~~ method of claim 19, wherein said mammalian organism is a human.

21. (currently amended): The ~~article~~ method of claim 19, wherein said data regarding the mammalian organism's metabolism comprises expressed sequence tag data.

22. (currently amended): The ~~article~~ method of claim 19, wherein said data regarding the mammalian organism's metabolism comprises biochemical units comprising metabolic steps, chemical compounds, reactions and/or enzymatic functions.

23. (currently amended): The ~~article~~ method of claim 22, wherein said enzymatic functions comprise genes and proteins.

24. (currently amended): The ~~article~~ method of claim 22, wherein each of said biochemical units is linked to an annotation table, said annotation table comprising at least one field.

25. (currently amended): The ~~article~~ method of claim 24, wherein said at least one field is selected from the group consisting of organ localization, tissue localization, intracellular localization, intracellular compartmentalization, subcellular localization in another organism, a relationship to a disease, and a reference to an information source.

26. (new): The method of claim 1, wherein the ranking of the metabolic pathways comprises assigning each pathway to one of the following categories:

- (a) a multi-step mammalian pathway wherein all reactions are catalyzed by known human enzymes and/or enzymes that have open reading frame (ORF) candidates in the human genome;
- (b) a multi-step pathway wherein at least one reaction is not catalyzed by an identified human enzyme or an enzyme that has an ORF candidate in the human genome; and
- (c) a single step pathway.

27. (new): The method of claim 3, wherein the ranking of the metabolic pathways comprises assigning each pathway to one of the following categories:

- (a) a multi-step mammalian pathway wherein all reactions are catalyzed by known human enzymes and/or enzymes that have open reading frame (ORF) candidates in the human genome;
- (b) a multi-step pathway wherein at least one reaction is not catalyzed by an identified human enzyme or an enzyme that has an ORF candidate in the human genome; and
- (c) a single step pathway.

28. (new): The method of claim 19, wherein the ranking of the metabolic pathways comprises assigning each pathway to one of the following categories:

- (a) a multi-step mammalian pathway wherein all reactions are catalyzed by known human enzymes and/or enzymes that have open reading frame (ORF) candidates in the human genome;
- (b) a multi-step pathway wherein at least one reaction is not catalyzed by an identified human enzyme or an enzyme that has an ORF candidate in the human genome; and
- (c) a single step pathway.